

Application No. 10/578,737
Paper Dated: November 17, 2009
In Reply to USPTO Correspondence of August 18, 2009
Attorney Docket No. 1455-061439

REMARKS

I. Introduction

The Office Action of August 18, 2009 has been reviewed and the Examiner's comments carefully considered. The present Amendment amends claims 83, 95, and 108 in accordance with the originally-filed specification. No new matter has been added. In addition, the present amendment cancels claims 82, 84, and 86. Claims 123-162 and 166-168 were withdrawn from further consideration in view of an earlier restriction requirement. The Applicants reserve the right to file a divisional application directed to the non-elected claims. Accordingly, claims 83, 85, 87-122, and 163-165 are currently subject to examination, and claims 83, 95, and 108 are in independent form. The Applicants respectfully request entry of the above amendment and favorable reconsideration of the claims.

II. Claim for Priority

Initially, the Applicants would like to note that the Examiner has pointed out on the Office Action Summary (Form PTOL-326) that the Applicants have not filed a certified copy of the foreign priority document as required by 35 U.S.C. §119(b). Pursuant to §1893.03(c) of the Manual of Patent Examining Procedure (MPEP), the requirement in PCT Rule 17 for a certified copy of the foreign priority application is normally fulfilled by the applicant providing a certified copy to the Receiving Office or to the International Bureau, or by the applicant requesting the Receiving Office to prepare and transmit the priority document to the International Bureau if the Receiving Office issued the priority document. The Applicants would like to note that copies of all of the priority documents were transmitted to the International Bureau on May 19, 2005. In addition, the Notice of Acceptance of Application under 35 U.S.C. 371 and 37 C.F.R. 1.495 dated September 11, 2008 indicates that the priority documents were received by the United States Patent and Trademark Office on May 10, 2006. Accordingly, the Applicants respectfully request that the Examiner acknowledge the claim for priority by indicating on the Office Action Summary in the next Office Action that all copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau.

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III. 35 U.S.C. § 112, Second Paragraph Rejection

Claims 82-122 and 163-165 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Examiner contends that the language “excellent formability” in claims 82, 83, 95, and 108 is a relative term which renders the claims indefinite. In addition, the Examiner has also rejected claims 95-122, 164, and 165 under 35 U.S.C. §112, second paragraph, because the language “0.0005 ~ 0.003 % or less of C” in claims 95 and 108 renders the claims indefinite. The Applicants believe that the above amendments to independent claims 83, 95, and 108 overcome the Examiner’s indefiniteness rejections. Reconsideration and withdrawal of this rejection are respectfully requested.

IV. 35 U.S.C. §102 Rejection

Claims 82, 83, and 85 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Japanese Patent Publication No. JP 09-31598 to Hayashida et al. (hereinafter the “Hayashida publication”). In view of the above amendments and the following remarks, the Applicants respectfully request reconsideration of this rejection.

Independent claim 82 has been cancelled by the present amendment thereby rendering the rejection of claim 82 moot.

As defined by amended independent claim 83, the present invention is directed to a cold rolled steel sheet having aging resistance that includes, in weight %: 0.003 % or less of C; 0.005 ~ 0.03 % of S; 0.01 ~ 0.1 % of Al; 0.02 % or less of N; 0.03 ~ 0.2% of P; 0.05 ~ 0.2 % of Mn; and the balance of Fe and other unavoidable impurities. A composition of Mn and S satisfies the relationship: $0.58 \times \text{Mn}/\text{S} \leq 10$, and the steel sheet comprises precipitates of MnS having an average size of 0.2 μm or less.

The Hayashida publication discloses a cold rolled steel sheet excellent in ductility and corrosion resistance. The cold rolled steel sheet has a composition consisting of, by weight ratio, less than or equal to 0.0060% carbon (C), less than or equal to 0.04% silicon (Si), less than or equal to 0.25% manganese (Mn), less than or equal to 0.025% phosphorus (P), less than or

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equal to 0.010% sulfur (S), 0.010-0.10% aluminum (Al), less than or equal to 0.0060% nitrogen (N), and the balance iron (Fe) with inevitable impurities.

The Hayashida publication does not teach or suggest a cold rolled steel sheet that includes, in weight percentage, 0.03 ~ 0.2% of P as required by amended independent claim 83. Instead, the Hayashida publication specifically requires a cold rolled steel sheet having a composition that includes less than or equal to 0.025% P.

Accordingly, the Applicants believe that the subject matter of amended independent claim 83 is not anticipated by the Hayashida publication. Reconsideration of the rejection of claim 83 is respectfully requested.

Claim 85 depends from and adds further limitations to amended independent claim 83 and is believed to be patentable for the reasons discussed hereinabove in connection with amended independent claim 83. Reconsideration of the rejection of claim 85 is respectfully requested.

V. 35 U.S.C. §103 Rejection

Claims 82-122 and 163-165 stand rejected under 35 U.S.C. § 103(a) for obviousness over International Patent Application Publication No. WO 2003/031670 to Murakami et al. (hereinafter “the Murakami publication”). In view of the foregoing amendments and the following comments, reconsideration of this rejection is respectfully requested.

Independent claim 82 has been cancelled by the present amendment thereby rendering the rejection of claim 82 moot.

As defined by independent claim 83, the present invention is directed to a cold rolled steel sheet having aging resistance that includes, in weight %: 0.003 % or less of C; 0.005 ~ 0.03 % of S; 0.01 ~ 0.1 % of Al; 0.02 % or less of N; 0.03 ~ 0.2% of P; 0.05 ~ 0.2 % of Mn; and the balance of Fe and other unavoidable impurities. A composition of Mn and S satisfies the relationship: $0.58 \times \text{Mn}/\text{S} \leq 10$, and the steel sheet comprises precipitates of MnS having an average size of 0.2 μm or less.

As defined by independent claim 95, the present invention is also directed to a cold rolled steel sheet having aging resistance that includes, in weight %: 0.0005 ~ 0.003 % of

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C; 0.003 ~ 0.025 % of S; 0.01 ~ 0.08 % of Al; 0.02 % or less of N; 0.2 % or less of P; 0.01 ~ 0.2 % of Cu; and the balance of Fe and other unavoidable impurities. A composition of Cu and S satisfies the relationship: $1 \leq 0.5 \times \text{Cu}/\text{S} \leq 10$, and the steel sheet comprises precipitates of CuS having an average size of 0.1 μm or less.

In addition, as defined by independent claim 108, the present invention is directed to a cold rolled steel sheet having aging resistance that includes, in weight %, 0.0005 ~ 0.003 % of C; 0.003 ~ 0.025 % of S; 0.01 ~ 0.08 % of Al; 0.02 % or less of N; 0.2 % or less of P; 0.03 ~ 0.2 % of Mn; 0.005 ~ 0.2 % of Cu; and the balance of Fe and other unavoidable impurities. A composition of Mn, Cu, and S satisfies the relationship: $\text{Mn} + \text{Cu} \leq 0.3$ and $2 \leq 0.5 \times (\text{Mn} + \text{Cu})/\text{S} \leq 20$, and the steel sheet includes precipitates of MnS, CuS, and (Mn, Cu)S having an average size of 0.2 μm or less.

Accordingly, the present invention relates to a cold rolled strip having high yield strength, high non-aging properties, and improved workability, and a method of manufacturing the same. The present invention is characterized by the inclusion of C, Mn, S, P, Al, N, and Cu; the numerical limitation of the composition range of Mn/S, Cu/S, Mn+Cu, and (Mn+Cu)/S; and/or the limitation of the average size of the precipitates of MnS, CuS, and (Mn, Cu)S to 2.0 μm or less.

The Murakami publication is directed to a steel sheet for a container, excellent in formability and fatigue property at a weld containing, by weight ratio, C: 0.0005 to 0.040%, Si: 0.002 to 0.50%, Mn: 0.03 to 2.00%, P: 0.002 to 0.080%, S: 0.0100 to 0.0600%, Al: 0.0010 to 0.0700%, N: 0.0020 to 0.0300%, and the balance Fe and unavoidable impurities. The content of solute N is 20 to 300 ppm. The Murakami publication relates to a steel sheet for a container having a weld, which can prevent a decline in productivity caused by buckling during the process of annealing the steel sheet, the occurrence of cracks at a weld during the manufacturing of a can, and the occurrence of cracks at a weld during the use of a can.

While claims 83, 95, and 108 of the present application and the Murakami publication are all directed to steel sheets, these steel sheets are fundamentally different. The steel sheets of claims 83, 95, and 108 are cold rolled steel sheets primarily suitable for use in

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automobile bodies, electronic appliances, and the like. On the other hand, the Murakami publication is directed to an ultra-thin steel sheet used as a material for a can produced by welding.

In addition, the Murakami publication fails to teach or suggest the composition range of Mn/S, Cu/S, Mn+Cu, (Mn+Cu)/S, and/or the average size of the precipitates of MnS, CuS, and (Mn, Cu)S being 2.0 μm or less as required by independent claims 83, 95, and/or 108. More specifically, claim 83 requires that the steel sheet include precipitates of MnS having an average size of 0.2 μm or less, claim 95 requires that the steel sheet include precipitates of CuS having an average size of 0.1 μm or less, and claim 108 requires that the steel sheet include precipitates of MnS, CuS, and (Mn,Cu)S having an average size of 0.2 μm or less. There is no teaching or suggestion in the Murakami publication that the steel sheet disclosed therein includes such precipitates. The cold rolled steel sheet of the present invention has high-yield strength due to such fine precipitates and excellent balance of strength-ductility and workability.

Furthermore, independent claim 95 further requires that the composition of Cu and S satisfies the relationship $1 \leq 0.5 * \text{Cu}/\text{S} \leq 10$. The Murakami publication does not teach or suggest such a feature. The Murakami publication discloses a steel sheet that includes 0.01-0.06 weight percent S and 0.0005-0.05 weight percent Cu. Accordingly, the Murakami publication discloses a range of $0.5 * \text{Cu}/\text{S}$ of 0.025-0.417. This range does not fall within the claimed range of 1-10. Accordingly, the Murakami publication does not teach or suggest that the composition of Cu and S satisfies the relationship $1 \leq 0.5 * \text{Cu}/\text{S} \leq 10$ as required by claim 95.

For the foregoing reasons, the Applicants believe that the subject matter of amended independent claims 83, 95, and 108 is not rendered obvious by the Murakami publication. Reconsideration of the rejection of claims 83, 95, and 108 is respectfully requested.

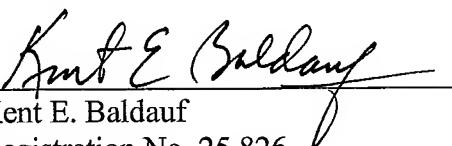
Claims 85, 87-94, 96-107, 109-122, and 163-165 depend from and add further limitations to amended independent claims 83, 95, 108, or a subsequent dependent claim, and are believed to be patentable for at least the reasons discussed hereinabove in connection with amended independent claims 83, 95, and 108. Reconsideration of the rejection of claims 85, 87-94, 96-107, 109-122, and 163-165 is respectfully requested.

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VI. Conclusion

Accordingly, Applicants respectfully solicit a Notice of Allowability be issued in the next action for pending claims 83, 85, 87-122, and 163-165. Should the Examiner have any questions or wish to discuss the application in further detail, the Examiner is invited to contact Applicants' undersigned representative by telephone at 412-471-8815.

Respectfully submitted,
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